9. (A) What are the various configurations of differential amplifier ? Also draw its diagram. 7

(B) What is the need of level shifting stage ? Also write the various level shifting techniques available. 6

OR

10. (A) Explain :

(a) Constant current bias

(b) Current mirror circuit. 8

(B) What is the use of swamping resistors in DIBO differential amplifier ? 5

11. (A) Convert the following :

(i) $(257.556)_8 = (?)_2$

(ii) $(7896.1225)_{10} = (?)_{16}$

(iii) $(111001.1010)_2 = (?)_{10}$

(iv) $(26AF.78C) = (?)_2$. 8

(B) Realize the expression :

Y = ABC + AB + AC + B + AB using basic gates after minimizing it. 6

OR

12. (A) What are the universal gates ? Why they are called so ? 4

(B) State and prove DeMorgan's laws. 6

(C) Develop 4 bit gray code. 4

Faculty of Engineering & Technology

Third Semester B.E. (Electrical Engg.) (C.B.S.) Examination

ELECTRONIC DEVICES & CIRCUITS

Time : Three Hours] [Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Answer **SIX** questions.

(3) Assume suitable data wherever necessary.

(4) Illustrate your answers wherever necessary with the help of neat sketches.

1. (A) Draw VI characteristics of PN-junction diode and explain how it depends upon temperature. 6

(B) Draw circuit diagram of full wave rectifier and hence obtain the expression for :

(i) Peak current

(ii) Ripple factor

(iii) Efficiency. 8

OR

2. (A) An AC voltage of 230 V is applied to half wave rectifier circuit through a transformer of turns ratio 10 : 1. The load resistance is 1 K and diode internal resistance is 20 Ω. Determine dc output power, efficiency and PIV. 7

(B) Explain the difference between Zener and Avalanche breakdown in diodes. 4

(C) Explain voltage doubler. 3

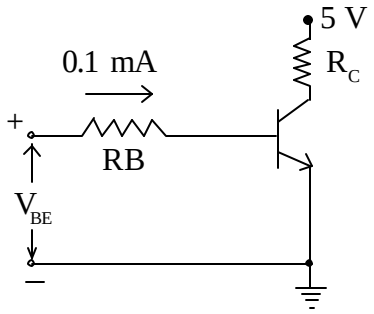
3. (A) What is the need of biasing ? Draw and explain voltage divider bias method of transistor biasing. 7

(B) Draw input and output characteristics of CE configuration and explain why CE configuration of transistor is mostly used. 6

OR

4. (A) Explain with necessary circuit diagram how transistor can be used as a switch. 6

(B) In the circuit shown below, what should be the minimum value of β such that transistor is in saturation ? Assume $V_{CE(sat)}$ = 0.2 V, R_C = 1 KΩ, R_B = 10 K Ω. 7



5. (A) Differentiate between class A, B, AB and C power amplifier. 6

(B) What do you mean by positive and negative feedback ? What are the advantages of negative feedback ? 7

OR

6. (A) Draw and explain the working of class B push-pull power amplifier and determine its efficiency. 5

(B) For class A power amplifier the operating point is located at I_C = 250 mA and V_{CE} = 8 V. Due to input signal the output collector current goes between 450 mA and 40 mA. The V_{CE} swings between 15 V and 1 V. Determine :

(a) The output power delivered

(b) The input power

(c) Collector efficiency

(d) Power dissipated by transistor. 8

7. (A) What is Barkhausen criteria for sustaining oscillations ? Explain. 6

(B) Explain the working of RC phase shift oscillator with neat diagram and derive the expression for its frequency of oscillation. 7

OR

8. (A) With the help of neat diagram, explain the working of JFET. Also draw and explain static drain characteristics. 7

(B) A JFET has V_P = –4.5 V, I_{DSS} = 10 mA, I_D = 2.5 mA, Determine the transconductance. 6

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